AMENDMENTS TO THE CLAIMS

This listing of claim will replace all prior versions, and listings, of claims in the application:

1.   (Previously Presented) A method of processing spread spectrum waveforms transmitted by a plurality of users of a spread spectrum system, comprising

distributing among a plurality of logic units parallel tasks each for computing a portion of a matrix indicative of cross correlations among the waveforms transmitted by the users,

partitioning computation of the cross-correlation matrix such that a computational load associated with a task distributed to one of said logic units is substantially equal to computational load associated with another task distributed to another logic unit,

executing with the plurality of logic units the distributed tasks.

2.   (Cancelled)

3.   (Previously Presented) The method of claim 1, further comprising generating detection statistics corresponding to symbols transmitted by the users and encoded in the waveforms as a function of the cross correlation matrix.

4.   (Original) The method of claim 3, further comprising generating estimates of the symbols based on the detection statistics.

5.   (Original) The method of claim 3, further comprising the step of defining a metric associated with each partition in accord with the relation:

$$B_i = A_i - A_{i+1}$$

wherein

A_i represents an area of a portion of the cross-correlation matrix corresponding to the ith partition, and

i represents an index corresponding to the number of logic units.

-2-

6.   (Original) The method of claim 5, further comprising the step of representing the cross-correlation matrix as a composition of a rectangular component and a triangular component.

7.   (Original) The method of claim 6, wherein each area A_i includes a first portion corresponding to the rectangular component and a second portion corresponding to the triangular component of the cross-correlation matrix.

8.   (Original) The method of claim 7, wherein the step of partitioning the matrix includes selecting the matrix associated with the partitions to be substantially equal.

9.   (Original) The method of claim 6, wherein the cross-correlation matrix is computed as a composition of a first component that represents correlations among time lags and code sequences associated with the waveforms transmitted by the users and a second component that represents correlations among multipath signal amplitudes associated with the waveforms transmitted by the users.

10.   (Currently Amended) A method of processing spread spectrum waveforms transmitted by a plurality of users of a spread spectrum system, comprising

        partitioning computation of a matrix representing cross-correlations among the waveforms transmitted by the users in accord with a pre-defined metric,

        distributing among a plurality of logic units parallel tasks each corresponding to one of said partitions for computing a portion of the matrix,

        executing with the plurality of logic units the distributed tasks,

        assembling said computed portions to generate the cross-correlation matrix, and representing the cross-correlation matrix as a composition of a first component that represents correlations among time lags and code sequences associated with the waveforms transmitted by the users and a second component that represents correlations among multipath signal amplitudes associated with the waveforms transmitted by the users[[.]].

11.   (Cancelled)

-3-
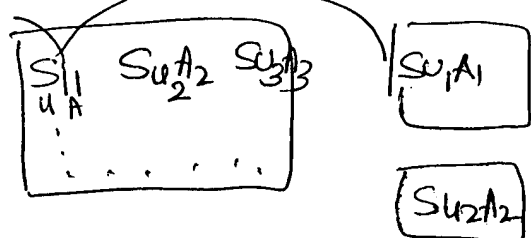
12.   (Previously Presented) The method of claim 10, wherein the step of partitioning comprises defining the metric in accord with the relation:

$$B_i = A_i - A_{i-1}$$

wherein

A_i represents an area of a portion of the cross-correlation matrix corresponding to the ith partition, and

i represents an index corresponding to the number of logic units.

13.   (Original) The method of claim 12, further comprising the step of generating detection statistics corresponding to symbols transmitted by the users and encoded in said waveforms as a function of the cross-correlation matrix.

14.   (Original) The method of claim 13, further comprising estimating the symbols based on said detection statistics.

15.   (Cancelled)

16.   (Previously Presented) The method of claim 10, further comprising the step of computing correlations among the code sequences associated with the respective users in accord with the relation:

$$\Gamma_{lk}[m] = \frac{1}{2N_l} \sum_{n=0}^{N-1} c_l^*[n] \cdot c_k[n-m]$$

wherein

$\Gamma_{lk}[m]$ represents correlation between l and k user codes corresponding to a shift of m chips,

$c_l^*[n]$ represents complex conjugate of the code sequences associated with the lth user,

$c_k[n-m]$ represents the code sequences associated with kth user,

N represents the length of the code, and

-4-

N_l represent the number of non-zero length of the code.

17. (Original) The method of claim 16, further comprising the step of computing the first component of the cross correlation matrix as a matrix component (herein referred to as C matrix) in accord with the relation:

$$C_{lkqq'}[m] = \sum_m g[mN_c + \tau] \cdot \Gamma_{lk}[m]$$

wherein

g is a pulse shape vector,

N_c is the number of samples per chip,

τ is a time lag, and

$\Gamma_{lk}[m]$ represents correlation between l and k user codes corresponding to a shift of m chips,

18. (Original) The method of claim 17, further comprising the step of computing the cross-correlation matrix (herein referred to as r matrix) in accord with the relation:

$$r_{lk}[m] = \sum_{q=1}^{k} \sum_{q'=1}^{L} \mathrm{Re}\left\{\hat{a}_{l_q}^* \, a_{kq'} \cdot C_{lkqq'}[m]\right\} = \mathrm{Re}\left\{a_l^H \cdot C_{lk}[m] \cdot a_k\right\}$$

wherein

$\hat{a}_{l_q}^*$ is an estimate of $a_{l_q}^*$, which represents a complex conjugate of one multipath amplitude component of the lth user,

$a_{kq'}$ is one multipath amplitude component associated with the kth user, and

C denotes the aforesaid C matrix.

-5-

19.   (Original) The method of claim 18, wherein the step of generating detection statistics comprises computing the detection statistics in accord with the relation:

$$y_l[m] = r_{ll}[0]b_l[m] + \sum_{k=1}^{K_u} r_{lk}[-1]b_k[m+1] + \sum_{k=1}^{K_u} [r_{lk}[0] - r_{ll}[0]\delta_{lk}]b_k[m] + \sum_{k=1}^{K_u} r_{lk}[1]b_k[m-1] + \eta_l[m]$$

wherein

$y_l[m]$ represents detection statistic for the mth symbol transmitted by the lth

user,

$r_{ll}[0]b_l[m]$ represents a signal of interest, and

remaining terms of the relations represent Multiple Access Interference (MAI)

and noise.

20.   (Original) The method of claim 19, wherein the step of generating symbol estimates comprises computing the estimates in accord with the relation:

$$\hat{b}_l[m] = sign\left\{ y_l[m] - \sum_{k=1}^{K_u} r_{lk}[-1]\hat{b}_k[m+1] - \sum_{k=1}^{K_u} [r_{lk}[0] - r_{ll}[0]\delta_{lk}]\hat{b}_k[m] - \sum_{k=1}^{K_u} r_{lk}[1]\hat{b}_k[m-1] \right\}$$

wherein

$\hat{b}_l[m]$ represents an estimate of the mth symbol transmitted by the lth user,

g is a pulse shape vector,

N_c is the number of samples per chip,

τ is a time lag, and

Γ represents the Γ matrix.

21.   (Cancelled)

-6-